



Critical Habitat for the Kauaʻi Cave Wolf Spider and Kauaʻi Cave Amphipod

What are the Kauaʻi cave wolf spider and Kauaʻi cave amphipod?

The Kauaʻi cave wolf spider (*Adelocosa anops*) and Kauaʻi cave amphipod (*Spelaeorchestia koloana*) are restricted to subterranean cracks, voids, spaces, and cave-bearing rock of the Koloa District of Kauaʻi Island. They are “trogllobites” – animals that live only in cave habitats.

In general, wolf spiders are relatively large spiders that utilize their sharp vision and swiftness to capture prey rather than relying on the use of a sticky web as do most spiders. They are found in various habitats throughout the world, but it is only in the Hawaiian Islands that they have evolved into a major group of cave-dwelling hunters. The Kauaʻi cave wolf spider is the only wolf spider that is known to be totally eyeless.

Amphipods are tiny shrimp-like crustaceans, related to crabs or sand fleas. While most amphipods occur in marine habitats, in the tropics they are common components of terrestrial ecosystems, often occurring in wet leaf litter. A number of cave-inhabiting amphipods are known throughout the world. Like the Kauaʻi cave wolf spider, the Kauaʻi cave amphipod has lost its eyes, an adaptive character associated with cave animals.

At its largest size, the cave wolf spider can reach a total leg span of about 1½ inches (4 cm). Its abdomen and legs are covered in light or silvery hairs that contribute to its pale appearance relative to most other

wolf spiders. It moves slowly through inner cave environments relying on touch, taste, and smell) to detect its prey (e.g., the amphipod and other cave inhabitants). It then pounces on its selected meal and subdues it with its large fangs.

The wolf spider reproduces at a very slow rate relative to terrestrial-dwelling wolf spiders, producing 10 to 30 offspring per clutch (terrestrial wolf spiders typically produce 50 to over 100 offspring per clutch).



Kauaʻi cave wolf spider

Photo by W. P. Mull

The cave amphipod reaches an adult length of about 1/4 inch (5 mm) and is translucent in appearance. The amphipod is a debris-eater, consuming woody debris derived from plant roots penetrating into the cave environment from intact plant communities growing over the cave. Without woody roots from intact, above ground plants, amphipod populations will decline and eventually disappear. Without amphipods or other cave-dwelling animals, the cave wolf spider will also disappear



Kauaʻi cave amphipod

Photo by W. P. Mull

from these unique cave environments. Amphipods with offspring have not yet been found in the cave environment, but their morphology suggests that they, like the wolf spider, reproduce very slowly relative to other terrestrial or marine species.

Both the Kauaʻi cave wolf spider and the Kauaʻi cave amphipod are found only in the Koloa area of Kauaʻi. While they occur in small, subterranean spaces, voids, and cracks in relatively young lava flows as well as consolidated calcium carbonate deposits (i.e., uplifted fossilized reef and sand dunes), these two species are only known from four and six caves respectively.

Not all caves in the Koloa area contain these unique animals. Not only must the cave contain a woody debris food source for the amphipod and other generalist feeders, the proper cave environment must be present. These animals require conditions at or approaching 100% relative humidity. If the caves, cracks, or voids are drafty or exposed to drying conditions, the cave animals will retreat, if possible, to more suitable habitats.

Both of these cave animals are threatened by habitat destruction due to construction, unsuitable pesticide use, and the release of certain biocontrol organisms. Human visitation and associated damage to caves as well as non-native predators also threaten these cave animals.

The Kauaʻi cave wolf spider and the Kauaʻi cave amphipod were discovered in



Kauaʻi cave wolf spider

Photo by W. P. Mull

1971 and placed on the list of endangered species on January 14, 2000. On June 2, 2000, the U.S. District Court ordered the Service to publish a final critical habitat designation for these species.

What is the Endangered Species Act?

Enacted by Congress in 1973, the U.S. Endangered Species Act (Act) provides a legal mechanism for the conservation of endangered and threatened species and the ecosystems upon which they depend. The Act places restrictions on a wide range of activities involving endangered and threatened animals and plants to help ensure their continued survival.

One such restriction requires all Federal agencies to consult with the Fish and Wildlife Service whenever an action they wish to fund, carry out, or authorize will affect an endangered or threatened species or adversely modify the species' critical habitat.

What is critical habitat?

Critical habitat is the term used in the Act to define those areas of habitat that are known to be essential for the conservation of an endangered or threatened species and that require special management or protection. The ultimate goal of the Endangered Species Act is to restore healthy populations of listed species within their native habitats so that they can be removed from the list of threatened and endangered species.

How do you determine what areas to designate as critical habitat?

The Fish and Wildlife Service considers the species' current range (*i.e.*, areas in which the species currently exists) and historic range (*i.e.*, areas that the species formerly occupied with in historic memory). Then we identify features of the habitat that are needed for the species in question to live, reproduce, and recover to the point where it can be removed from the list of endangered and threatened species. Examples of features of the habitat or requirements that are generally considered are:

- Space for individuals' and populations' growth and for normal behavior;
- Food, water, air, light, minerals, or

other nutritional or physiological requirements;

- Cover or shelter;
- Sites for breeding, reproduction, or rearing of offspring, germination, or seed dispersal; and
- Areas that are protected from disturbance or are representative of the historic geographical and ecological distributions of a species.

For the Kaua'i cave wolf spider and the Kaua'i cave amphipod we considered two environmental requirements in determining critical habitat: (1) the presence of dark and/or stagnant air zones within the caves and cracks; and (2) the presence of roots from living, nontoxic plants. The maximum elevation of the proposed critical habitat is less than 600 feet (183 m).

How is critical habitat designated?

The Fish and Wildlife Service considers habitat features needed for life and successful reproduction of the species. We are required to use the best scientific data available and to consider the economic and other impacts of designating an area as critical habitat.

Can the public participate in the process for deciding whether to designate critical habitat?

The Act ensures the public ample opportunity to comment on critical habitat proposals and our policy is to encourage such participation in the rulemaking process. Proposed designations are published in the *Federal Register* and provide for a public comment period of at least 60 days. The proposed critical habitat designations for the Kaua'i cave wolf spider and Kaua'i cave amphipod were published in the *Federal Register* on March 27, 2002, and the public comment period is open until May 27, 2002.

To ensure that all interested members of the public are aware of the proposals, announcements of the proposed rulemaking and the public comment period are published in local newspapers. In addition, we directly notify Federal, State, and local agencies, as well as other interested parties. If requested within 45 days of the published proposal, a public hearing is held in the vicinity of the affected area.

All written and oral information provided during the public comment period is analyzed carefully by the Service prior to a final decision on critical habitat designation, and responses to comments received are published in the decision document.

Are potential economic impacts considered?

Yes. Although the decision to list a species as threatened or endangered must be based solely on biological grounds, economic and social effects of critical habitat designations are analyzed and considered before such designations are completed. An area may be excluded from proposed critical habitat if the Secretary of the Interior finds that the economic or other burdens of such an exclusion outweigh the conservation benefits of including the area. However, excluding an area from a critical habitat designation is allowed only if doing so will not lead to the extinction of the species.

The economic analysis for the Kaua'i cave wolf spider and Kaua'i cave amphipod will be made available to the public for review when it is completed. At that time, the public comment period for the proposed critical habitat rule will also be either extended or reopened, as appropriate.

Is critical habitat similar to a wilderness area or wildlife refuge?

No. Critical habitat designation does not in any way create a wilderness area, preserve, or wildlife refuge, nor does it close an area to human access or use. It applies only to activities sponsored at least in part by Federal agencies. Critical habitat designations do not constitute land management plans.

How does the designation of critical habitat increase protection of threatened and endangered wildlife?

If critical habitat is designated for a species, all Federal agencies, under section 7 of the Act, must consult with the Fish and Wildlife Service to ensure that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of the critical habitat. In addition, designation of critical habitat focuses attention on those areas that are important to the species' recovery.

How does critical habitat affect the State or private landowner?

Critical habitat designation does not affect activities on State or private lands unless some sort of Federal permit, license, or funding is involved. Activities of the State or a private landowner, such as farming, grazing, and logging, generally are not affected by critical habitat designation, even if the landowner's property is within the geographical boundaries of the critical habitat. The designation has no impact on individual, town, county, or State actions if there is no Federal involvement, nor does it signal any intent of the Federal government to acquire or control the land.

How does critical habitat affect Federal agencies?

Federal agencies are required to ensure that any activity they fund, carry out, or authorize is not likely to jeopardize the survival of a listed species or destroy or adversely modify its critical habitat. By consulting with the Fish and Wildlife Service, an agency can usually minimize or avoid any potential conflicts with listed

species and their critical habitat, and the proposed project may occur.

How many Hawaiian invertebrates are federally listed as endangered or threatened, and how many have critical habitat?

Currently, five groups of Hawaiian invertebrates are listed as endangered or threatened: the O'ahu tree snails, Blackburn's sphinx moth, Newcomb's snail, and the Kaua'i cave wolf spider and amphipod. Critical habitat has not been designated for any of these animals, though it has been proposed for the Newcomb's snail. Critical habitat designations also are being developed for the sphinx moth.

Where is critical habitat for the Kaua'i cave wolf spider and amphipod proposed?

We are proposing three units of critical habitat for these species, all in the Koloa District of southern Kaua'i. The total acreage is 4,193 acres, mostly on private land. A total of 316 acres are on State of Hawai'i and County of Kaua'i lands.

These units include both occupied and unoccupied habitat for the cave species.

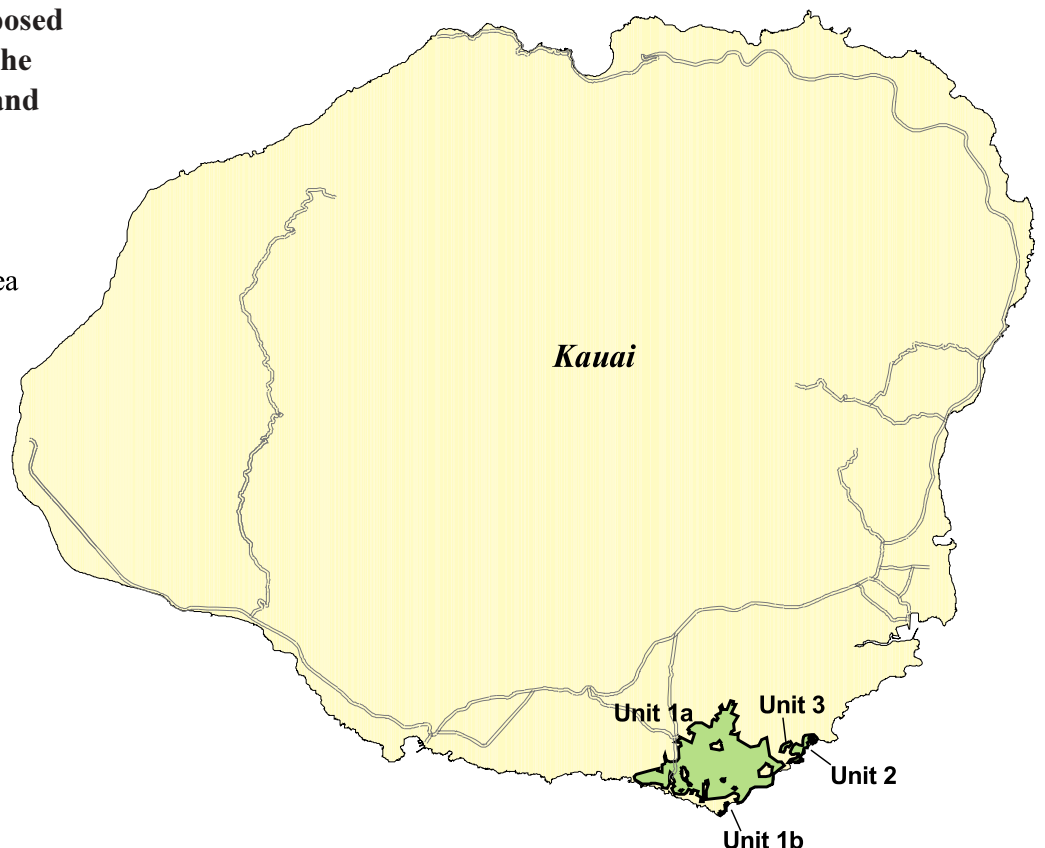
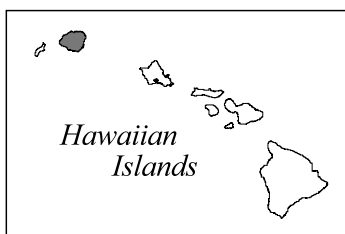
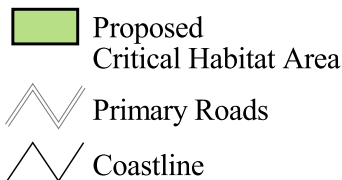
What type of information are you looking for in public comments?

We intend that any final action resulting from this proposal be as accurate and as effective as possible. Therefore, we solicit comments or suggestions from the public, other concerned governmental agencies, the scientific community, industry, or any other interested party concerning this proposed rule. We are particularly interested in comments concerning:

(1) The reasons why any area should or should not be determined to be critical habitat as provided by section 4 of the Act, including whether the benefits of designation will outweigh any threats to the species due to designation;

(2) Specific information on the number and/or distribution of Kaua'i cave wolf spider and/or the Kaua'i cave amphipod, and what areas are essential to the conservation of these species and why;

General Locations of Proposed Critical Habitat Units for the Kaua'i Cave Wolf Spider and Kaua'i Cave Amphipod



(3) Whether lands within proposed critical habitat are currently being managed to address conservation needs of the Kaua‘i cave wolf spider and/or the Kaua‘i cave amphipod;

(4) Land use practices and current or planned activities in the subject areas and their possible impacts on proposed critical habitat;

(5) Any foreseeable economic or other impacts resulting from the proposed designation of critical habitat, in particular, any impacts on small entities or families;

(6) Whether future development and approval of conservation measures (e.g., Conservation Agreements, Safe Harbor Agreements, etc.) should be excluded from critical habitat and, if so, by what mechanism; and,

(7) Economic and other values associated with designating critical habitat for the Kaua‘i cave wolf spider and/or the Kaua‘i cave amphipod, such as those derived from nonconsumptive uses (e.g., hiking, sightseeing, enhanced watershed protection, improved air quality, increased soil retention, “existence values,” and reductions in administrative costs).

How do we submit our comments?

If you wish to comment, you may submit your comments and materials by one of two methods:

(1) You may submit written comments and information to Paul Henson, Field Supervisor, Pacific Islands Fish and Wildlife Office, U.S. Fish and Wildlife Service, 300 Ala Moana Boulevard, Room 3–122, Box 50088, Honolulu, Hawai‘i 96850.

(2) You may hand-deliver written comments to our Pacific Islands Fish and Wildlife Office at the address given above.

Questions? Please feel free to call the U.S. Fish and Wildlife Service’s Pacific Islands Fish and Wildlife Office in Honolulu (808 541 3441) for more information.